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June 30, 2003

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# Logistics

Allegations Concerning the  
Administration of Contracts for  
Electronic Flight Instruments on  
the C-130H Aircraft  
(D-2003-115)

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Department of Defense  
Office of the Inspector General

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### **Acronyms**

CAR	Corrective Action Request
DCMA	Defense Contract Management Agency
EFI	Electronic Flight Instrument
ICS	Interim Contractor Support
LMAS	Lockheed Martin Aeronautics Systems



INSPECTOR GENERAL  
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June 30, 2003

MEMORANDUM FOR ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)  
DIRECTOR, DEFENSE CONTRACT MANAGEMENT  
AGENCY

SUBJECT: Report on Allegations Concerning the Administration of Contracts for  
Electronic Flight Instruments on the C-130H Aircraft  
(Report No. D-2003-115)

We are providing this report for information and use. This audit was performed in response to allegations made to the Defense Hotline. We considered management comments on the draft of this report when preparing the final report.

Comments conformed to the requirements of DoD Directive 7650.3; therefore, additional comments are not required.

We appreciate the courtesies extended to the staff. Questions should be directed to Mr. Bruce Burton at (703) 604-9071 (DSN 664-9071) or Mr. Thomas Bartoszek at (703) 604-9014 (DSN 664-9014). See Appendix C for the report distribution. The team members are listed inside the back cover.

*David K. Steensma*

David K. Steensma  
Deputy Assistant Inspector General  
for Auditing

## **Office of the Inspector General of the Department of Defense**

**Report No. D-2003-115**

(Project No. D2003AB-0085)

**June 30, 2003**

### **Allegations Concerning the Administration of Contracts for Electronic Flight Instruments on the C-130H Aircraft**

#### **Executive Summary**

**Who Should Read This Report and Why?** Managers of acquisition programs and logistics planners should read this report to obtain information concerning the need to coordinate contracting and logistics planning processes. In addition, contract specialists, inspectors, and engineers at the Defense Contract Management Agency should read this report to understand and use the Corrective Action Request process.

**Background.** This report is one in a series of reports that discusses allegations made to the Defense Hotline concerning management oversight of the contractor's performance on the C-130, F-22, and C-5 aircraft. This audit is in response to an allegation referred to the Defense Hotline concerning the Air Force C-130H aircraft. The C-130 transport aircraft is responsible for airlifting troops and equipment into hostile areas. More than 350 C-130H variants were produced. Lockheed Martin Aeronautics Systems is the prime contractor for the aircraft. Only 111 aircraft, including those that were produced from 1992 until 1996, have Electronic Flight Instruments. The Electronic Flight Instruments have an active matrix liquid crystal display, which provides horizontal and vertical navigation data to the pilot and copilot.

The allegation states that the Defense Contract Management Agency's administration of contracts for the Electronic Flight Instruments on the C-130H aircraft was inadequate. Specifically, the complainant alleges that agency officials did not issue a Level III Corrective Action Request to address problems with Lockheed Martin's oversight of its subcontractor and its inability to identify and resolve problems associated with the Electronic Flight Instruments. According to the complainant, this action would have formally documented the problem with the contractor's quality processes and procedures, recorded corrective steps planned, and placed the contractor on the contractor alert list. Placement on the contractor list could have resulted in the loss of future contracts and would have drawn attention to existing problems such as cost increases and schedule delays. An inadequate supply of parts to repair the failed electronic flight instrument components resulted in the grounding of C-130 aircraft.

**Results.** Contract administration and logistics planning for the Electronic Flight Instruments on the C-130H was inadequate from 1994 to 2000, but program officials identified a solution to the Electronic Flight Instrument problems in October 2000. We substantiated that Defense Contract Management Agency contract administration for the Electronic Flight Instruments on the C-130H was inadequate. We did not substantiate that the draft Corrective Action Request delayed the resolution of the Electronic Flight Instrument issue. We partially substantiated that inadequate oversight of the subcontractor's repair process led to poor Electronic Flight Instrument performance.

Lack of Defense Contract Management Agency and Program Office action allowed Electronic Flight Instrument performance problems to continue. Although program management officials identified and implemented a solution for the poor performance of the Electronic Flight Instruments, lack of adequate logistics management and oversight of the prime contractor's operations led to more than 1,100 Electronic Flight Instrument failures in a 34-month period ending October 2002, and grounding of 16 C-130H aircraft through May 2000. Completing a purchasing system review, preparing a surveillance plan focusing on subcontracting and the quality of subcontractor parts at Lockheed Martin Aeronautical Systems, and issuing local procedures for using a draft Corrective Action Request will improve the oversight of the contractor's operations. Improvements in logistics management should also include a requirement for Lockheed Martin Aeronautical Systems to resolve the lack of supply availability in the Interim Contractor Support contract and develop an acquisition strategy addressing logistics support for the new Electronic Flight Instruments. (See the Finding section of the report for information on the detailed recommendations.)

**Management Comments.** The Executive Director, Contract Management Operations, Defense Contract Management Agency concurred with the recommendations stating that the Defense Contract Management Agency's contract management office at Lockheed Martin Fort Worth has scheduled a review of the contractor purchasing system to commence September 2003. In addition, he stated that the Defense Contract Management Agency at Lockheed Martin Marietta is working on surveillance plans and has prepared a draft procedure for using draft Corrective Action Requests. The Associate Deputy Assistant Secretary for Contracting, Department of the Air Force provided comments on the finding and concurred with the recommendations stating that a management of assets clause would be included if a cost benefit analysis showed it to be in the best interest of the Government. See the Finding section of the report for a discussion of management comments and the Management Comments section of the report for the complete text of the comments.

# Table of Contents

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<b>Executive Summary</b>	i
<b>Background</b>	1
<b>Objectives</b>	2
<b>Finding</b>	
Management of the Electronic Flight Instruments on the C-130H Aircraft	3
<b>Appendixes</b>	
A. Scope and Methodology	13
Prior Coverage	13
B. Summary of Allegations and Audit Results	14
C. Report Distribution	16
<b>Management Comments</b>	
Department of Air Force	17
Defense Contract Management Agency	22

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## Background

We performed this audit in response to an allegation to the Defense Hotline concerning the Defense Contract Management Agency's (DCMA) oversight of the contractor's performance on the C-130, F-22, and C-5 aircraft. This is one in a series of reports concerning the allegations. Specifically, this report addresses allegations related to the Electronic Flight Instruments (EFI) on the C-130H aircraft.

**C-130 Aircraft.** The C-130 aircraft performs missions such as airlift support, Antarctic resupply, weather reconnaissance, fire fighting, and medical relief. The Air Force C-130H version is a transport vessel responsible for airlifting troops and equipment into hostile areas. The Air Mobility Command, the Air Force Special Operations Command, the Air Force Reserve Command, and the Air National Guard use the C-130H. More than 350 C-130H variants were produced. Lockheed Martin Aeronautics Systems (LMAS) in Marietta, Georgia, is the prime contractor for the C-130 aircraft.

**Electronic Flight Instruments.** The EFIs provide horizontal and vertical navigation data to the pilot and copilot. Only 111 C-130H aircraft are fitted with either the 200-series EFI or the 550-series EFI. Each aircraft has four EFIs with glass components. The glass component was a commercial off the shelf acquisition that was no longer available after 1997 because of changes in technology and commercial application. If more than one EFI fails, the aircraft is not allowed to perform its mission due to safety of flight issues. Avionics Display Corporation, a subcontractor to LMAS, supplied the 200-series EFI. In December 1999, due to continued financial problems, Avionics Display Corporation sold its Government product line including the EFIs to L-3 Communications. L-3 Communications supplied the 550-series EFI.

**Defense Contract Management Agency Oversight and Guidance.** DCMA is an independent support agency that is responsible for assessing contractors' manufacturing, production, and quality assurance processes. DCMA has an office at the LMAS facility in Marietta, Georgia. To assist officials in their oversight effort, DCMA issued Directive 1, otherwise known as the One Book, that implements policy for the performance of contract management functions. The One Book states that when contractual noncompliances are detected, corrective action notice must be issued to correct the deficiency. Noncompliance issues must be resolved at the lowest possible level, but if the contractor is nonresponsive, they must be escalated to a Corrective Action Request (CAR). The CAR is an indicator that elements of the contractor's quality system are not in compliance with contract requirements. DCMA officials must maintain a record of CARs initiated, action taken, and followup needed to verify corrections made. There are four CAR levels. A Level III CAR identifies a serious contractual noncompliance to the contractor's top management. A Level III CAR may be coupled with contractual remedies such as reductions of progress payments, cost disallowances, cure notices, show cause letters, and business management system disapprovals.



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**Allegations.** One allegation stated that the DCMA contract administration for the EFI on the C-130H aircraft was inadequate. We substantiated this allegation. The complainant also alleged that DCMA did not issue a Level III CAR against LMAS to address problems with its oversight of the subcontractor and the inability of LMAS to identify and resolve problems associated with the EFI. The complainant believed that the DCMA purposely did not issue the Level III CAR to deflect attention from the contractor's significant deficiencies. In addition, the complainant further alleged that the draft CAR delayed the resolution of the EFI issue. We did not substantiate this allegation. The complainant also alleged that LMAS did not exercise adequate oversight of the subcontractor's repair process; that the failed EFI components could not be replaced because there was an inadequate supply of rear glass assemblies. We partially substantiated this allegation. See Appendix B for a more complete summary of the allegations and audit results.

## Objectives

The overall audit objective was to determine whether the Defense Contract Management Agency appropriately administered EFI contracts for the C-130H aircraft.

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## Management of the Electronic Flight Instruments on the C-130H Aircraft

Lack of DCMA and Program Office action allowed EFI performance problems to continue until C-130H mission readiness was affected. Specifically, the lack of action included insufficient subcontractor oversight and limited logistics planning. Those conditions occurred because officials did not:

- Include a repair plus management of assets clause in the Interim Contractor Support (ICS) contract requiring LMAS to identify and resolve the lack of supply availability,
- Develop an acquisition strategy addressing logistics support for the new 550-series EFIs that addresses sustainment and spare parts,
- Review the purchasing system and prepare a surveillance plan that included subcontracting and the quality of subcontractor parts at LMAS, and
- Issue local procedures for draft CARs.

As a result, more than 1,100 EFI failures occurred and 16 C-130H aircraft were grounded. In addition, confusion concerning DCMA policy continues and future logistics problems from poor planning and oversight may occur.

### Criteria

**Federal Acquisition Regulation.** The Federal Acquisition Regulation Subpart 44.3, “Contractor Purchasing System Reviews,” requires the administrative contracting officer to initially conduct a contractor purchasing system review of the contractor’s pricing policies and contract performance. Thereafter, the administrative contracting officer must determine every 3 years if a followup review is needed. The administrative contracting officer must also maintain sufficient oversight to ensure that the contractor is effectively managing its purchasing program in accordance with the surveillance plan developed by the administrative contracting officer. The surveillance plan covers pertinent phases of a contractor’s purchasing system including performance. Without an approved purchasing system, the prime contractor must obtain written permission from the administrative contracting officer to subcontract for each prime contract awarded.

**The Interim Defense Acquisition Guidebook.** The Interim Defense Acquisition Guidebook, October 30, 2002, states that an acquisition strategy shall summarize an analysis of the industrial base capability including program support. The analysis should identify DoD investments needed to create the manufacturing capabilities and should address product technology, obsolescence, and replacement of limited-life items. The Guidebook also states that DoD

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Components must ensure that an adequate industrial capability and capacity exists to meet post-production operational needs before completing and terminating production.

**DCMA Directive 1.** The DCMA Directive implements policy for the performance of contract management functions. The Directive states that performance management is the preferred management style because it is impossible to predefine the best way to perform a task when the circumstances under which the process will be executed vary. Therefore, all processes must have some flexibility, and the more the circumstances vary, the more flexibility must be built into the process.

## **EFI Performance, Subcontractor Oversight, and Logistics Management**

Poor EFI performance, insufficient subcontractor oversight, and inadequate logistics management led to more than 1,100 EFI failures and the grounding of 16 C-130H aircraft.

**Performance of the 200-series EFI.** The EFIs began to fail shortly after fielding of the C-130H aircraft started in 1992. The EFIs displayed incorrect data, or showed a solid white line on the display screen (line out condition). No specific cause was identified for the failures until 1995. During the early stages of production, repairs averaged about twelve EFI units per month. The EFIs were repaired by the LMAS subcontractor and returned to service.

In 1995, LMAS identified overheating of the rear glass assembly as a major cause of EFI failures and that, in 1997, this commercial glass component was no longer being produced. The Air Force viewed the risk as minimal because the rate of failure was only about 12 per month, and the Air Force had a contract with LMAS to repair electronics on the aircraft. However, the failures continued to increase, and a March 2000 briefing by L-3, the new subcontractor, showed that failures had increased to about 30 per month from March 1999 to January 2000. The failures caused 16 of the C-130H aircraft to be grounded and incapable of completing their mission from 1999 to 2000.

**EFI Failures and Grounding of C-130H Aircraft.** We identified that 1,103 200-series EFI failures occurred from January 2000 until October 2002. More than half of the EFIs failed multiple times. For example, one EFI failed 10 times, another failed 12 times, and a third failed 15 times. The table that follows shows the number of EFIs that experienced failure, the number of times that each unit failed, and the total number of failures.

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**Electronic Flight Instrument Failures  
January 2000 - October 2002**

<u>Number of EFI Units</u>	<u>Times Failed for Each Unit</u>	<u>Total Failures</u>
201	1	201
103	2	206
65	3	195
40	4	160
26	5	130
15	6	90
6	7	42
3	8	24
2	9	18
1	10	10
1	12	12
1	15	15
<b>Total</b>	<b>464</b>	<b>1,103</b>

**Logistics Management of the EFIs.** In March 2000, the LMAS subcontractor, L-3, briefed program management officials to ensure that they understood EFI supportability issues for the C-130H fleet. The briefing also revealed that there were about 480 EFIs in service, with a spares inventory of about 107 EFI units. Because of increasing failures and a lack of adequate spares, the ability to sustain C-130H aircraft was being affected.

Although program management officials stated that they had been aware of the cause of the EFI failure and knew of the changing technology, they took no action to acquire a sufficient number of spare EFIs. They also had taken no effective actions to solve the overheating problem.

**Subcontractor Oversight.** Although officials at Warner Robins Air Logistics Center repeatedly requested LMAS officials to address the EFI performance problems, no formal action was taken and failures continued to increase and aircraft began to be grounded. DCMA decided that formal action was needed and issued a draft, unsigned Level III CAR on September 24, 2000, to LMAS to expedite repair of the EFI units.

**Draft Level III CAR.** The draft CAR stated that the LMAS subcontractor, L-3, was unable to meet the schedule and revised the delivery time. It also stated that LMAS did not manage and control the subcontractor to ensure that the requirements for repair and timely delivery were met; that LMAS did not provide the Government with a comprehensive corrective action plan to correct contractual deficiencies and develop alternative measures to seek new sources or accomplish the repair themselves; that Air Force officials participated in numerous meetings with LMAS to resolve the quality and delinquency issue without success; and that many of the EFIs had to be repaired more than once.

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The draft CAR requested LMAS to initiate immediate corrective action to control the performance and quality of supplies and services provided by L-3, and submit a comprehensive corrective action plan that addressed:

- a determination of cause,
- a proposed corrective action,
- a milestone chart identifying specific events to be accomplished, and
- a delivery schedule to reconcile delinquent deliveries with contract requirements.

On September 26, 2000, DCMA officials issued a letter to LMAS stating that the draft Level III CAR was to be treated as if it were official. Management officials stated that DCMA would refrain from issuing an official Level III CAR if they received a corrective action plan by October 2, 2000, addressing the EFI issues.

The former Director of the C-130 System Program Office informed us that the CAR was issued in draft to prevent termination of the contract. The System Program Office was not willing to terminate the contract because the EFI was only one of several subsystems that were supported by the ICS contract. The Deputy Director in September 2000 would have preferred to issue an “I am concerned” letter to LMAS top management to expedite repair and or replacement of the EFI. However, DCMA management, with concurrence from the C-130 Program Manager, decided to issue a draft CAR rather than an official CAR because of complications with the contract since other subsystems were involved. Officials believed this was the best solution.

## **Contractor’s Response and EFI Solution**

**LMAS Response.** On October 2, 2000, LMAS responded to the draft CAR stating that it was pursuing options to increase the repairs of the EFIs, resolve the glass issue, and increase the average time between EFI failures. LMAS stated that replacement of the entire unit was more cost-effective than replacing just the glass, but that replacement required an extensive development effort and additional nonrecurring costs. LMAS also stated that it assigned personnel to L-3 to expedite the repairs, continued to work on identifying a solution for EFI failures, reviewed repair procedures and quality assurance processes at L-3, and developed a plan to continue the repair of EFI units at L-3.

LMAS responded by the date required, and appeared to take the problems more seriously when the draft CAR was issued, perhaps because the draft CAR had higher visibility within the LMAS structure. LMAS also changed its management structure. Both logistics and the marketing functions for the C-130 were under the same organization prior to the issuance of the CAR. After the draft CAR, LMAS separated those functions into different components.

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**EFI Solution.** In November 2000, LMAS sent a letter to DCMA identifying that it had completed its engineering study and review of the EFI failures. The results showed that a cooling solution was needed for each EFI to prevent the overheating. On November 9, 2000, DCMA officials notified LMAS to proceed with the cooling solution for 400 200-series EFIs. In September 2001, the C-130 System Program Office at Warner Robins Air Logistics Center negotiated a contract directly with L-3 for 132 new 550-series EFIs at \$5.2 million with a 2-year warranty at \$288,816. The 2-year warranty was 6 percent of the cost of the new EFI unit and allowed the System Program Office sufficient time to provide funding for future maintenance of the new EFIs. According to the Air Force, they subsequently bought an additional 143 550-series EFIs. Although the 550-series EFI was a commercial off the shelf product, it was a form, fit, and function replacement for the failed 200-series EFI. The new model had been used successfully by the Navy on the S-3 aircraft.

The Air Force did not procure a one-for-one replacement of the 200-series EFIs. After performing an analysis, the Air Force determined that it needed only 132 to install on the C-130H aircraft. The replaced 132 series 200 EFIs will be used as spares until the advent of the Avionics Modernization Program that is scheduled for 2007. This program will replace all of the EFIs because it will modernize the avionics of the C-130 fleet to meet the latest standards for performance and safety and to lower the total cost of ownership.

We believe that these steps were positive and provided a realistic solution to the problems under the circumstances. However, the extensive difficulties in reaching the EFI solution showed that the relationship between the contractor and the Government was not effective in this particular matter.

## **Additional Improvements in Logistics Management**

Additional improvements are needed in logistics management and oversight of subcontractor operations. Specific issues that need to be addressed are supply availability on the ICS contract, logistics support for the new EFIs, purchase system and subcontractor oversight at LMAS, and procedures for issuing draft CARs.

**Supply Availability.** In 1994, as part of logistics support, the System Program Office awarded an ICS contract to LMAS with a 5-year option for the repair of electronic components on the C-130H aircraft. The contract provided other services as part of the logistics support effort that included services, repair, administration, data, and technical support. The repair costs of the EFIs were reimbursed on a cost-plus-fixed-fee basis. A new contract was issued in March 1999 and expired on April 30, 2003. The ICS contract was renewed in May 2003.

Neither ICS contract included a management of assets clause for the identification and replacement of obsolete parts, identification of diminishing manufacturing resources, and the submission of analysis of high failure parts. This omission contributed to the delay in fixing and replacing the EFIs because the current contract did not require LMAS to identify new sources to replace obsolete parts

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such as the 200-series EFI, which became obsolete in 1997. System Program Office officials renewed the current support contract for 1 year in May 2003, and included a management of assets clause in the new contract. Based on guidance in the Interim Defense Acquisition Guidebook, C-130H System Program Office officials should ensure that the clause is included in contracts to require contractors to identify new sources to replace obsolete parts.

**Logistics Support.** System Program Office officials at Warner Robins Air Logistics Center stated that they were unable to locate an acquisition strategy addressing logistics support for the C-130H aircraft. In addition, officials stated that the source-of-repair assignment process was not complete for the C-130H aircraft. The source-of-repair assignment process is the primary method used by depot maintenance officials to assess sustainment strategies. The bridge from production to full logistics support is the ICS contract. The C-130H ICS contract has been in place for more than 10 years. Officials acknowledge that they are behind in the source-of-repair assignment process because obtaining proprietary data for subsystems is difficult. However, they are completing the source-of-repair assignment process for implementation in 2004.

The lack of a written acquisition strategy for the C-130H aircraft contributed to the lack of funding for repair and replacement of the EFI. The acquisition strategy would have identified DoD investments needed to create the capabilities and the capacity beyond post-production operational needs and would have addressed product technology obsolescence and replacement of limited-life items. In addition, it would have evaluated industry deficiencies on program design or manufacturing capabilities and their effects. In accordance with guidance in the Interim Defense Acquisition Guidebook, C-130H System Program Office officials need to develop a written acquisition strategy that addresses logistics issues for the new EFI.

**Purchasing System Reviews and Oversight.** The DCMA-Atlanta office was responsible for performing purchasing system reviews at LMAS in Marietta, Georgia. It performed the last review at LMAS in August 1998. During that review, officials analyzed the policies and procedures on the LMAS subcontractor rating system but did not analyze the system itself. Officials informed us that they do not look for quality or obsolescence issues during a purchasing system review.

In January 1999 and 2000, DCMA-Atlanta extended the purchasing system approval because no apparent problems had occurred since the last review, and scheduled another purchasing system review in August 2002. However, due to a reorganization, DCMA-Dallas Fort Worth became cognizant over LMAS and has not identified a date for the next purchasing system review. In addition, DCMA-Atlanta officials do not have a surveillance plan for LMAS that covers pertinent phases of a contractor's purchasing system such as subcontractor oversight and performance.

The purchasing system review should analyze technical and subcontractor processes and procedures and include an analysis of deliveries. DCMA should have reviewed the purchasing system in 1999 and in 2000 when significant problems associated with late deliveries of the EFI's occurred. Higher-level

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management at LMAS would have been alerted of the problems with the EFIs before the aircraft were grounded. However DCMA-Atlanta did not perform the review and continued approving the LMAS purchasing system.

The Federal Acquisitions Regulation requires the administrative contracting officer to develop a surveillance plan that covers all phases of the contractor's purchasing system, including subcontract award and performance, perform a review to ensure a sufficient level of oversight of the contractor's purchasing system, and determine whether continued approval is warranted.

**Draft CAR Guidance.** The DCMA office at LMAS issued an undated Standard Operating Procedure No. 99-04 Corrective Action Request Process. The procedure defined the purpose of a CAR, the process DCMA officials at LMAS must follow when initiating a CAR, and the responsibilities of DCMA officials for CARs. The standard operating procedure, however, did not discuss the issuance of a draft CAR. DCMA issued a draft Level III CAR in response to the EFI failures to ensure that the EFI issue was resolved. Officials stated that following the issuance of the draft CAR, the contractor took action to address the failures.

The DCMA Directive 1 addresses the issuances of CARs when contractual noncompliances are detected and corrective action must be taken. The local Standard Operating Procedure No. 99-04 further defines the requirements for issuance of a CAR. Neither the DCMA Directive 1 nor Standard Operating Procedure No. 99-04 addresses the issuance of a draft CAR. Based on the type of flexible management approach recommended by Directive 1, the draft CAR would permit the flexibility needed to accomplish the objective. In this case, the draft CAR accomplished the objective and LMAS took action. DCMA management needs to determine whether actions such as draft CARs were envisioned within the Directive 1 policy for issuing CARs. If so, policy on issuing draft CARs needs to be clarified in local DCMA guidance.

## Conclusion

Program management officials for the C-130H aircraft did not adequately perform logistics management and include contract provisions that required LMAS to identify the lack of supply availability. They did not fund an early solution to the EFI overheating issue and did not acquire a sufficient supply of spares or identify other sources for the EFI once they knew of the changing technology and obsolescence issue on the glass. In addition, DCMA officials had not performed a purchasing system review since 1998, did not prepare a surveillance plan to ensure quality of LMAS subcontractor parts and timely deliveries, and did not issue clear guidance involving draft CARs. The EFI failures were the culmination of several deficiencies that led to catastrophic failure and the eventual grounding of the C-130H aircraft. Both DCMA and the C-130 System Program Office officials must now take action to strengthen controls over logistics support of the EFIs and management of the quality and timeliness of repairs and deliveries.



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## Management Comments on the Finding and Audit Response

The Associate Deputy Assistant Secretary for Contracting, Department of the Air Force provided comments on the finding in this report. Her comments identified the finding as three separate findings. While this report has only one finding, we will address her three concerns as findings. Additional comments are in Appendix B.

**Management Comments Finding 1.** The Associate Deputy Assistant Secretary for Contracting, Department of the Air Force stated that even if LMAS was required to resolve supply availability, it may still have been a problem because the failures increased from 12 to 30 per month. While the audit focused on the 220-series EFIs the report should have acknowledged that the new 550-series EFIs were never part of the problem but were part of the get well plan.

**Audit Response.** Since failure of EFIs occurred soon after fielding and LMAS knew as early as 1995 that failures were caused by overheating, we believe supply availability should have been a concern before dramatic increase in failures occurred. In the EFI solution section of the report, we stated that the System Program Office negotiated a contract with L-3 for 132 new 550-series EFIs. They were a form, fit, and function replacement for the failed 220-series, which the Navy had used successfully. We concluded that the steps in evaluating the 550-series EFIs were positive and provided a realistic solution to the problem. Additionally, as discussed in the report, the supply availability was a contributing factor to the overall EFI performance problem, rather than the sole factor.

**Management Comments Finding 2.** The Associate Deputy stated that the report's assessment that the EFI problem was caused by inadequate logistics management is speculative and unsupported. She stated that the management team provided more than 100 spare EFIs and fully funded the repair contract based on observed failures of 12 per month. The unexpected increase to 30 per month was sudden and caused several supportability issues that could not have been anticipated or planned for once the problem was identified officials began monthly program management reviews and direct contact with L-3 to ensure that parts from non repairable assets were used when needed. A new cooling lid was developed by LMAS and supplied to L-3 for implementation, and officials procured the new 550-series EFIs to alleviate continued failures and parts obsolescence problems with the 220-series EFIs. She also said that the draft CAR was issued because they believed it was the best course of action. Further, she indicated that the report incorrectly stated that the Air Force needed only 132 550-series EFIs, when the Government purchased 132 initially, and then purchased another 143 later.

**Audit Response.** We agree that the Air Force could not anticipate the sudden increase in failures that occurred. However, when the EFIs were failing during production with a line out condition, a supportability analysis in the engineering process would have helped to determine the cause of the line out, the most cost-effective way to correct the problem, and the financial support needed to ensure the supportability of the system. When heat was identified as the cause of the line

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out in 1995, a solution was not developed, which was attributed to a lack of funding. In 1997, when Air Force officials were notified by LMAS that the commercial glass component of the EFI was no longer being produced, they did not take action to ensure a lifetime buy of spare parts. Again, the Air Force attributed this to funding. Only when the EFI failures caused 16 aircraft to be grounded from 1999 to 2000 did the Air Force fully address logistics support and require LMAS to conduct research and development efforts for cooling the EFIs and solving the overheating problem. Clearly the facts showed that Air Force officials took little or no action to address the EFI problem early in production when they knew problems were causing line outs, or later when the cause of the problem was identified. The lack of action continued even after the supplier was no longer manufacturing the part. Significant measures were taken only when a catastrophic failure caused the grounding of 16 aircraft. We revised the report to reflect 275 550-series EFI's.

**Management Comments Finding 3.** The Associate Deputy stated that the management of assets clause was not required and is not in all repair contracts because it may not be cost-effective. In addition, she stated that there was an acquisition strategy for the C-130H aircraft. Further, she stated that she does not concur with the report's conclusion that management officials did not adequately plan logistics management because their management team made sound decisions based on the information and funding available at the time. She reiterated that until the units started to fail at a high rate, sufficient spares existed and adequate funding was available for the purchase of EFI repairs.

**Audit Response.** We agree that the management of assets clause may not be appropriate for each contract and that an analysis must be conducted to determine if it is cost-effective. With respect to the acquisition strategy for the C-130H aircraft, program officials informed us that one did not exist and they were unable to provide the strategy. We maintain that contract administration and logistics planning for the EFI were not adequate. Program management officials did not take action in 1992 when the EFIs began to fail; they did not identify the cause and make appropriate changes to the design. In 1995, when the problem was identified as overheating, again management took no action. In 1997, when officials were notified by LMAS that the commercial glass component of the EFI was no longer being produced, management did not decide to buy a lifetime supply of spare parts. Finally, only when the aircraft was grounded did management take effective action to remedy the situation and correct the EFI problem.

## **Recommendations and Management Comments**

**1. We recommend that the Program Director, C-130 System Program Office:**

**a. Include a repair plus a management of assets clause in future Interim Contractor Support Contracts.**

**b. Prepare an acquisition strategy addressing logistics support for the 550-series Electronic Flight Instruments that addresses sustainment and spare parts.**

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**Management Comments.** The Associate Deputy Assistant Secretary for Contracting, Department of the Air Force concurred with both recommendations; however, she stated that the Air Force would conduct a cost and benefit analysis before adding a management of asset clause to the contract. If the analysis concluded that the clause would be beneficial to the Government, the Air Force would add it.

**2. We recommend that the Commander, Defense Contract Management Agency:**

**a. Review the purchasing system at Lockheed Martin Aeronautics Systems in Marietta, Georgia, and identify a sufficient level of oversight for the contractor's purchasing system.**

**b. Prepare a written surveillance plan to include subcontracting and the quality of subcontractor parts.**

**c. Establish and issue local written guidance on the process used for draft Corrective Action Requests at the Defense Contract Management Agency, Marietta, Georgia.**

**Management Comments.** The Executive Director, Contract Management Operations, Defense Contract Management Agency concurred with the recommendations. He stated that a Contractor Purchasing System Review had not been performed since August 1998 because the review schedule was affected by the consolidation of several Lockheed Martin Aeronautics locations and the move of the Lockheed Martin business offices to Fort Worth, Texas. However, the responsible Defense Contract Management Agency office at Lockheed Martin, Fort Worth, Texas, has scheduled a review for September 2003. The Director also stated that the Defense Contract Management Agency is working on a surveillance plan that will help monitor the contractor's oversight of its subcontractors and will cover both subcontracting and the quality of subcontract parts. In addition, the Director stated that the Defense Contract Management Agency office has prepared a draft procedure for using draft Corrective Action Requests.

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## Appendix A. Scope and Methodology

We performed audit work to examine allegations made to the Defense Hotline that DCMA administration of EFI contracts on the C-130H aircraft was inadequate. We reviewed documents dated from 1998 through 2003. We reviewed the existing policy used to issue Corrective Action Requests. We also reviewed contract files for the C-130H and the EFI. We discussed the allegations with the complainants. We also interviewed current and former personnel from DCMA and the System Program Office of the C-130 Aircraft at Warner Robins Air Logistics Center.

We performed this audit from October 2002 through May 2003 in accordance with generally accepted government auditing standards. We did not review the management control program because the audit scope was limited to the allegations of mismanagement of contracts.

**Use of Computer-Processed Data.** We did not use computer-processed data to perform this audit.

**General Accounting Office High-Risk Area.** The General Accounting Office has identified several high-risk areas in DoD. This report provides coverage of the quality of logistics support high-risk area.

### Prior Coverage

No prior coverage has been conducted on the EFI during the last 5 years.

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## Appendix B. Summary of Allegations and Audit Results

Of the three allegations concerning the EFIs on the C-130H aircraft, we substantiated the first allegation, did not substantiate the second allegation, and partially substantiated the third allegation.

**Allegation 1:** DCMA oversight of contract administration for the EFI on the C-130H aircraft was inadequate.

**Substantiated.** DCMA oversight of contract administration was inadequate. Specifically, DCMA had not performed a purchasing system review since August 1998 and had not formulated a written surveillance plan to monitor the contractor's oversight of its subcontractor.

**Allegation 2.** DCMA did not take remedial action against LMAS by issuing a Level III CAR to address and resolve the failed 220-series EFIs. Instead, DCMA issued a draft Level III CAR and kept LMAS off the contractor alert list. The complainants believed that this lack of formal action was a deliberate attempt to keep the contractor off the alert list. The allegation states that the formal CAR action would document the contractor's quality processes and procedures, record corrective steps planned, and place the contractor on the contractor alert list. Placement on that list could have resulted in the loss of future contracts and drawn attention to existing problems at the facility such as cost increases and schedule delays.

**Unsubstantiated.** DCMA used a flexible management approach that it believed would solve the problem with the least complications for the services that were being procured under the ICS contract. The action achieved improved performance.

**Allegation 3:** LMAS did not exercise adequate oversight of the repair process at its subcontractor. The LMAS subcontractor's poor performance on the ICS contract was leading to C-130H aircraft being grounded because of parts shortages. The inaction resulted in the eventual grounding of 16 C-130H aircraft because of an inadequate supply to replace the failed EFI components, and delayed the resolution of the EFI issue.

**Partially Substantiated.** Although the contractor's oversight of its subcontractor was inadequate, it was not the sole reason for poor EFI performance. The problem with the EFIs began in 1992 when the Air Force and the C-130 System Program Office did not fund the effort to identify the reason for the failure of the EFIs and, later, in 1997, when the System Program Office did not fund sufficient EFI spares to ensure a lifetime supply when the part became obsolete. If the problem and the solution had been addressed and if spare parts had been procured for the EFIs, the aircraft would not have been grounded and the problem could have been solved.

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## Management Comments and Audit Response

**Management Comments.** The Associate Deputy Assistant Secretary for Contracting, Department of the Air Force stated that in 1992 the program office did not have sufficient reason to fund an effort to identify the failures of the EFIs. Officials were experiencing only three failures a month and the failed assets were being repaired expeditiously. She stated that in 1997 there were only 12 failures per month not 30. In addition, there were 107 spares in the supply chain and the program management team determined that the number of failures and availability of spare parts were sufficient to meet the monthly demand. Accordingly, it was not necessary to make a lifetime buy.

**Audit Response.** While the failures may have been only three per month initially, this failure rate, so soon after fielding, should have been a concern, and the 300-percent increase in failures in 1997 should have been alarming. By the time the failure rate reached 30, the program was at significant risk. The line out conditions initially experienced in 1992 pointed to a problem. The risk should have been reviewed early in the program, or at least when the cause was known, and the program office certainly should have taken action when notified of the need for the lifetime supply of spare parts. However, former program officials stated that the spare parts issue was not addressed due to funding constraints.

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## **Appendix C. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense (Comptroller)/Chief Financial Officer  
Deputy Chief Financial Officer  
Deputy Comptroller (Program/Budget)  
Director, Defense Procurement and Acquisition Policy

### **Department of the Air Force**

Assistant Secretary of the Air Force (Financial Management and Comptroller)  
Auditor General, Department of the Air Force

### **Other Defense Organizations**

Director, Defense Contract Audit Agency  
Director, Defense Contract Management Agency

### **Non-Defense Federal Organization**

Office of Management and Budget

### **Congressional Committees and Subcommittees, Chairman and Ranking Minority Member**

Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
Senate Committee on Finance  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Reform  
House Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform  
House Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform  
House Subcommittee on Technology, Information Policy, Intergovernmental Relations, and the Census, Committee on Government Reform

# Department of the Air Force Comments



Office Of The Assistant Secretary

DEPARTMENT OF THE AIR FORCE  
WASHINGTON DC

20 JUN 2003

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING  
OFFICE OF THE INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE

FROM: SAF/AQC  
1060 Air Force Pentagon  
Washington, DC 20330-1060

SUBJECT: DoD Draft Report, "Allegations Concerning the Administration of  
Contracts for Electronic Flight Instructions on the C-130H Aircraft,  
dated 23 May 2003 (Project No. D2003AB-0085)

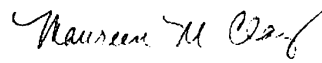
This is in reply to your memorandum requesting the Assistant Secretary of the Air Force (Contracting) to provide Air Force comments on subject report. We understand that the overall objective of your audit was to determine whether the Defense Contract Management Agency appropriately administered contracts for Electronic Flight Instructions for the C-130H aircraft.

Our response (attachment 1) addresses allegations and recommendations directed to the Air Force, specifically the C-130 System Program Office (SPO) at Warner Robins Air Logistics Center. In the draft audit report (attachment 2), you question the overall acquisition strategy employed by the C-130 SPO in managing the C-130H program. We acknowledge that the acquisition strategy for the procurement of an aircraft or an aircraft system should address both short and long term logistics support of the item being procured. However, we strongly believe that the program management team at the C-130 SPO made sound decisions based on the information, the available funding, and the known requirements at the time.

Our action officer for this matter is Vicky Revel, 703-588-7047,



[Vicky.revel@pentagon.af.mil](mailto:Vicky.revel@pentagon.af.mil). Thank you for the opportunity to comment on this draft audit report.



MAUREEN M. CLAY, Col, USAF  
Associate Deputy Assistant  
Secretary (Contracting)  
Assistant Secretary (Acquisition)

Attachments:

1. Air Force Comments
2. DoD Draft Report

cc: SAF/FMPF

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**Air Force Comments**  
**On**  
**Audit Report, Allegations Concerning the Administration of Contracts for**  
**Electronic Flight Instruments on the C-130H Aircraft**  
**Project Code D2003AB-0085**

**Finding #1: Lack of DCMA and Program Office action allowed Electronic Flight Instrument (EFI) performance problems to continue until C-130H mission readiness was affected. Specifically, the lack of action included insufficient subcontractor oversight and limited logistics planning.**

The audit found that these conditions occurred because officials did not include a repair plus management of assets clause in the Interim Contractor Support (ICS) contract requiring Lockheed Martin Aeronautics Systems (LMAS) to identify and resolve the lack of supply availability, and officials did not develop an acquisition strategy addressing logistics support for the new 550-series EFIs that addresses sustainment and spare parts. The EFI, however, were equipment that came on the aircraft when it left the production line and were not addressed in a separate acquisition strategy.

The Air Force believes that it is wrong to assume that if LMAS had been required to resolve supply availability, we would not have had a problem with supply availability. The problem existed because of a sudden, unexpected, threefold increase in the number of failures, from 12 to 30 per month. The audit findings focused on the failed 220 series EFIs, but the report should also acknowledge that the new 550 series EFIs were never part of the problem, but instead were a part of the “get well” plan.

**Finding #2: Poor EFI performance, insufficient subcontractor oversight, and inadequate logistics management led to more than 1,100 EFI failures and the grounding of 15 C-130H aircraft.**

We do not disagree that an EFI problem developed, however, to say that this was caused by inadequate logistics management is speculative and unsupported. The program management team initially provided over 100 spare EFIs and a fully funded repair contract to repair failed assets based upon a predicted and observed 12 failures per month. After several years, however, failures unexpectedly increased to over 30 per month. This unexpected, sudden increase in failures caused several supportability issues that could not have been anticipated or planned for in advance.

Regarding logistics management of the EFIs, we nonconcur with the statement, “Although program management officials stated that they were aware of the cause of the EFI failure and knew of the changing technology, they took no action to acquire a sufficient number of spare EFIs”. The program management team procured over 100 spare EFIs based on predicted and observed failure rates. This spare level adequately kept the EFI supply pipeline flowing. Also, the C-130 SPO began monthly Program Management Reviews (PMR), thus LMAS had more oversight and direct contact with L-3 and ensured that L-3 used parts from nonreparable assets when needed. A new

cooling lid was proposed, designed and developed by LMAS and subsequently provided to L-3 for implementation. Additionally, the C-130 SPO worked very diligently with their customers, i.e., users, operators, to ensure that the repaired EFIs were sent to the places that needed them most. Finally, the program management team procured the newer 550-series EFIs to alleviate continued failures and parts obsolescence issues with the 220-series EFIs.

We would clarify that the draft Level II Corrective Action Report (CAR) was not issued to prevent termination of the contract. A formal CAR can be issued without termination. A draft CAR was issued because we believed it was the best course of action, and our decision was proven to be correct since it did cause the contractor to respond appropriately. Also, the draft audit report inaccurately states, "the Air Force determined that it only needed 132 (550-series EFIs) to install on the C-130H aircraft." The government initially bought 132 new, 550-series EFIs; then a subsequent buy of 143 550-series EFIs brought the total to 273.

**Finding #3: Additional improvements are needed in logistics management and oversight of subcontractor operations. Specific issues that need to be addressed are supply availability on the ICS contract, logistics support for the new EFIs, purchase system and subcontractor oversight at LMAS, and procedures for issuing draft CARs.**

Although we agree with the statement, "Neither ICS contract included a "Management of Assets" clause for the identification and replacement of obsolete parts and identification of diminishing manufacturing resources and the submission of analysis of high failure parts," we would point out that such a clause is not required and is often not in repair contracts. To include such a clause in every contract would be cost prohibitive. Also, the contractor was obligated to repair assets within 30 days. If they were not able to do so, discussions would occur and problems like obsolete parts and diminishing manufacturing resources would be addressed.

Concerning logistics support, we would like to correct the statement, "System Program Office officials at Warner Robins Air Logistics Center stated that they were unable to locate an acquisition strategy addressing logistics support for the C-130H aircraft." The C-130H aircraft procurement was a congressionally mandated buy, which was initially managed at Wright-Patterson AFB. Program management responsibility was later transferred to Robins AFB. Acquisition strategy for the C-130H aircraft does exist.

**Conclusion: Program management officials for the C-130H aircraft did not adequately perform logistics management and include contract provisions that required LMAS to identify the lack of supply availability. They did not fund an early solution to the EFI overheating issue and did not acquire a sufficient supply of spares or identify obsolescence issue on the glass.**

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We nonconcur on the conclusion reached by the DoD IG. The program management team made sound decisions based on the information, available funding and requirements at the time. In hindsight, another strategy may have yielded a better result. However, the decisions were made at the time with the information at hand. We must reiterate that until units started suddenly failing at a high rate, sufficient spares existed. In addition, adequate funding was available for the purchase of EFI repairs.

**RECOMMENDATIONS:**

- 1. We recommend that the Program Director, C-130 Systems Program Office:**
  - a. Include a repair plus a management of assets clause in future Interim Contractor Support Contracts.**
  - b. Prepare an acquisition strategy addressing logistics support for the 550-series Electronic Flight Instruments that addresses sustainment and spare parts.**

We concur, with comments, to Recommendation 1a. Contractually requiring a contractor to manage an asset may be unnecessarily costly. Therefore, before adding such a clause to a contract, we would conduct a cost/benefit analysis. If it is in the best interest of the government and taxpayer to include a "Management of Assets" clause, then it should be added. We have included certain management requirements to our current ICS contract because of the value it adds.

We concur with recommendation 1b.

**Appendix B. Summary of Allegations and Audit Results:**

We nonconcur with the statement, "The problem with the EFI began in 1992 when the Air Force and the C-130 System Program Office did not fund the effort to identify the reason for the failure of the EFI and, later, in 1997, when the System Program Office did not fund sufficient EFI spares to ensure a lifetime supply when the part became obsolete." In 1992 the C-130 System Program Office did not have sufficient reason to fund an effort to identify the failure of the EFI. The field was experiencing only three failures per month and the failed assets were being repaired expeditiously. Additionally, in 1997, the operator was still only experiencing only 12 failures per month, not 30. 107 spares existed in the supply chain and the program management team determined sufficient spares existed to meet the monthly expected demand. At that time it was not necessary to make a lifetime buy.

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# Defense Contract Management Agency Comments



**DEFENSE CONTRACT MANAGEMENT AGENCY**  
6350 WALKER LANE, SUITE 300  
ALEXANDRIA, VIRGINIA 22310-3226

JUN 12 2003

IN REPLY  
REFER TO DCMA-OC

MEMORANDUM FOR THE ASSISTANT INSPECTOR GENERAL FOR AUDITING, DoD

SUBJECT: DoDIG Draft Report, Allegations Concerning the Administration of Contracts for  
Electronic Flight Instruments on the C-130H Aircraft (D2003AB-0085)

DCMA comments to the recommendations at 2.a, 2.b. and 2.c of the subject report are  
attached. Please contact Mark Young, DCMA-OCT, at (703) 428-0956, with any questions,  
comments or concerns.

  
ROBERT W. SCHMITT  
Executive Director  
Contract Management Operations

Attachment

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**SUBJECT:** DoDIG Draft Report, Allegations Concerning the  
Administration of Contracts for Electronic Flight  
Instruments on the C-130H Aircraft (D2003AB-0085)

**FINDING:** Management of the Electronic Flight Instruments  
on the C-130H Aircraft.  
Lack of DCMA and Program Office action allowed EFI  
performance problems to continue until C-130H mission  
readiness was affected. Specifically, the lack of action  
included insufficient subcontractor oversight and limited  
logistics planning. Those conditions occurred because  
officials did not:

- Include a repair plus management of assets clause in  
the Interim Contractor Support (ICS) contract  
requiring LMAS to identify and resolve the lack of  
supply availability,
- Develop an acquisition strategy addressing logistics  
support for the new 550-series EFIs that addresses  
sustainment and spare parts,
- Review the purchasing system and prepare a  
surveillance plan that included subcontracting and  
the quality of subcontractor parts of LMAS, and
- Issue local procedures for draft CARs.

As a result, more than 1,100 EFI failures occurred and 16  
C-130H aircraft were grounded. In addition, confusion  
concerning DCMA policy continues and future logistics  
problems from poor planning and oversight may occur.

**DCMA Comments:** None.

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SUBJECT: DoDIG Draft Report, Allegations Concerning the  
Administration of Contracts for Electronic Flight  
Instruments on the C-130H Aircraft (D2003AB-0085)

**Recommendation 2.a:** We recommend that the Defense Contract Management Agency review the purchasing system at Lockheed Martin Aeronautics Systems in Marietta, Georgia, and identify a sufficient level of oversight for the contractor's purchasing system.

**DCMA Comments: Concur.** DCMA did not comply with FAR 44.304 and it's internal policy regarding Contractor Purchasing System Review (CPSR). A purchasing system review has not been performed since August of 1998 and the ACO does not have a surveillance plan to monitor the contractor's oversight of its' subcontractor. The scheduling was impacted when Lockheed Martin Aeronautics consolidated its' Marietta, Palmdale and Fort Worth locations and moved it's business offices to Fort Worth. As a result DCMA Atlanta did not make a determination of the necessity and subsequently conduct the requisite CPSR. DCMA Lockheed Martin Fort Worth, the responsible Contract Management Office, has scheduled a CPSR to commence on September 3, 2003.

**Disposition:**

( X ) Action is ongoing.

Estimated Completion Date: September 30, 2003

( ) Action is considered complete.

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**SUBJECT:** DoDIG Draft Report, Allegations Concerning the  
Administration of Contracts for Electronic Flight  
Instruments on the C-130H Aircraft (D2003AB-0085)

**Recommendation 2.b:** We recommend that the Defense Contract  
Management Agency prepare a written surveillance plan to  
include subcontracting and the quality of subcontractor  
parts.

**DCMA Comments: Concur.** DCMA Lockheed Martin Marietta is  
currently working on surveillance plans to cover both  
subcontracting and the quality of subcontract parts. This  
effort is being accomplished via a teaming effort with the  
contractor through their joint Delivery Management  
integrated process team.

**Disposition:**

- ( X ) Action is ongoing.  
Estimated Completion Date: August 31, 2003
- ( ) Action is considered complete.



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SUBJECT: DoDIG Draft Report, Allegations Concerning the  
Administration of Contracts for Electronic Flight  
Instruments on the C-130H Aircraft (D2003AB-0085)

**Recommendation 2.c:** We recommend that the Defense Contract Management Agency establish and issue local written guidance on the process used for draft Corrective Action Requests at the Defense Contract Management Agency, Marietta, Georgia.

**DCMA Comments:** Concur. DCMA policy dictates that a Corrective Action Request (CAR) is utilized to formally communicate a contractual non-conformance to the supplier and request corrective action. Additionally, due the seriousness of a Level III CAR, it is recommended that it be signed by a CMO supervisor or higher CMO management personnel and coordinated with the ACO. Authority to deviate from this policy is acceptable and vested with the local Contract Management Office (CMO). DCMA Lockheed Martin Marietta has prepared a draft procedure detailing the use of draft CARs that is currently being staffed within the CMO.

**Disposition:**

- ( X ) Action is ongoing.
  - Estimated Completion Date: June 30, 2003
- ( ) Action is considered complete.

## **Team Members**

The Acquisition Management Directorate, Office of the Deputy Inspector General for Auditing of the Department of Defense prepared this report. Personnel of the Office of the Inspector General of the Department of Defense who contributed to the report are listed below.

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